KC-101 (US); R. 132 AGHVAMI DECLARATION

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of	:	Abdol Hamid Aghvami et al.
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Examiner	:	HOLLIDAY, JAIME MICHELE
Group Art Unit	:	2617

Hon. Commissioner for Patents
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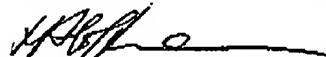
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DECLARATION OF
(Under 37 C.F.R. § 1.132)

Sir:

I, Professor Abdol Hamid Aghvami, declare as follows:

I am a Subject of the United Kingdom.

I graduated with a Ph.D. in Electrical Engineering from King's College London in 1981.

My C. V. is attached hereto (Appendix I).

I am a named first inventor with invention described and claimed therein.

I have read and understand the subject Office action mailed August 25, 2006. I have read and understood the referenced patent application. I hereby traverse the rejection of the pending claims 1-46 for the following reasons.

Background of our Invention

Very briefly, our invention relates to a micro and macro cell in a CDMA type system, in which spectral efficiency is improved by enabling use of the same frequency band in both the macro and micro cell.

Discussion

Claim 1

US 5 920 819 (Asanuma)

The Examiner has said that:

> "... *applicant argues that the cited references do not disclose or suggest a method of improving the use of CDMA systems; instead the cited references focus on FDMA/TDMA systems.*
>
> *Examiner respectfully disagrees, because, as cited in Applicant's response, Asanuma does disclose that the embodiments* <u>*may be applied to a system using a CDMA scheme (Asanuma; col. 12 lines 16-19)*</u>. *This is the suggestion and support to apply the cited invention in a CDMA system.*" (emphasis added)

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In FDMA systems, resources are carrier frequencies. In CDMA systems, resources are power and code. This is the main difference between these two multiple access schemes, and from this we can deduce which type of multiple access scheme a proposal such as a scientific paper or patent application is intended.

Radio Resource Management (RRM) in these two groups of multiple access schemes is fundamentally different, so it is not possible to propose an algorithm for RRM in one of these two multiple access schemes, and then easily extend it to the other by just saying: "this algorithm can be used (or extended) to CDMA systems as well". Interference calculation, Radio Resource Management, Call Admission Control and the dynamics of FDMA systems are totally different to CDMA systems. In particular there are lots of papers introducing RRM for CDMA systems in 1990 – 1995 (the beginning stage of UMTS systems), whereas RRM for FDMA systems was already well established at that time.

The abstract of Asanuma says: "When a channel for micro cell is assigned to a mobile station PS1 of a micro cell, one <u>carrier frequency</u> whose reception level is lower than a threshold level is selected from a plurality of <u>up carrier frequencies</u> and <u>down carrier frequencies</u> which a macro cell system holds, an up channel and a down channel for micro cell are set on the <u>selected carrier frequency</u>, the above channels are assigned to the mobile station PS1 of the micro cell to permit radio communication <u>based on the TDD</u> scheme between the mobile station PS1 and a micro cell base station BSb1".

Firstly, it is obvious that "carrier frequency" here is mentioned as the resource to be allocated to a mobile station, and there is a "plurality of carrier frequencies" to select from; therefore Asanuma's proposal must be concerned with FDMA systems. Secondly, the selected "carrier frequency" at the end is assigned to the mobile station of the micro cell to permit communication based on TDD scheme between mobile station and micro cell base station. However in our invention there is "only one carrier frequency" band,

which is the carrier frequency band of the whole CDMA system for both macro cell and micro cell networks. In addition there is no TDD mode in the micro cell.

However, at column 12 line 15, it is claimed that the idea is not limited to the case where FDMA scheme is used as radio access scheme of macro cell system, but can also applied to a system using the TDMA scheme or CDMA scheme. We tried to see if there is any description in Asanuma of <u>how</u> to extend his idea to CDMA systems:

-Figure 2: look at box: Time Division Multiplex.

-Figure 3: look at flow chart: box: "search for channels from radio channels of macro cell". In CDMA systems since there is no such pool of channels, neither in micro cell nor in macro cell, how can the algorithm "search"? The same problem is there for the rest of the flowchart, which is the main algorithm of the Asanuma proposal. This flow chart clearly shows that the concept only works for FDMA systems.

-Figure 4: It is explicitly expressed that: "when up carrier frequency of FDMA macro cell is selected".

-Figure 4: It is explicitly expressed that: "when down carrier frequency of FDMA macro cell is selected".

-Figures 4 and 6 clearly show how TDD is applied at the micro cell.

-Figures 8 and 9: show "when up/down carrier frequency of TDMA macro cell is selected..."

-Column 2, line 58 -65, the objective of the invention is said to be: "... to provide an overlay cell type mobile communication system capable of simplifying the process of setting both of an up channel and a down channel for micro cell in a short time, attaining a sufficiently large number of channels for micro cell...". In CDMA overlay systems, as there is not essentially large number of channels to be selected, there is therefore no need for this selection process at all, so the invention is completely useless for CDMA systems, because there is no such a selection process to be simplified or otherwise. Finally in column 6, when the detailed description of the invention is presented, lines 21 and 44 mention explicitly that FDMA scheme is used as the radio access-duplex scheme.

For these reasons we believe that the invention of Asanuma is only applicable to an FDMA system and cannot be applied to a CDMA system.

Although Asanuma has not shown how his disclosure could be possible for a CDMA system, from the suggestion of extension to a TDMA system, we concluded that the only case in which their invention may work is when the macro cell system uses several CDMA bands. This means that different CDMA systems with different frequency carriers work at the same time at the macro cell. Then the Asanuma invention may help (although it is not explained exactly how though) to select one of those frequency bands for the micro cell. But this is a very extraordinary and unlikely possibility, because CDMA systems used in cellular systems are Wide band CDMA systems (for example in UMTS the bandwidth is 5 MHz) so even if more than one CDMA system work in an area, the number of bands would not be large (two or three maximum, because of the limited spectrum allocated to 3G systems), and for this number of "available carrier frequencies" at macro cell, the Asanuma invention is useless.

Our proposed idea is completely different, even to this unusual extension to CDMA case, because our claim relates to a micro and macro cell which use the same frequency band, not an FDMA micro cell system that uses one of several CDMA frequency bands used at macro cell. As explained above this is very unlikely in any event and is not practical because of the different bandwidths used in CDMA and FDMA systems.

Conclusions:

My overall conclusion based on these observations is that Asanuma is not applicable to CDMA systems, simply because it does not fit with the way CDMA systems work. Therefore I cannot see how our invention can be obvious in view of Asanuma.

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I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements, and the like, so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of any patent issued thereon.

Signed in full: _____ Dated: _____

Abdol. H. Aghvami, Ph.D.

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    I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements, and the like, so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of any patent issued thereon.

Signed in full: *Abdel-hamid Aghvami*   Dated: *22 December 2006*

                    Abdol. H. Aghvami, Ph.D.

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Professor H Aghvami - Kings College London   http://www.kcl.ac.uk/schools/pse/divengrcsearch/oor/he/bio.html...

Professor Hamid Aghvami

Biography

Hamid Aghvami joined the academic staff at King's in 1984. In 1989 he was promoted to Reader and in 1993 was promoted Professor in Telecommunications Engineering. He is presently the Director of the Centre for Telecommunications Research at King's. Professor Aghvami carries out consulting work on Digital Radio Communications Systems for both British and International companies. He has published over 400 technical papers and given invited talks all over the world on various aspects of Personal and Mobile Radio Communications as well as giving courses on the subject world wide. He was Visiting Professor at NTT Radio Communication Systems Laboratories in 1990 and Senior Research Fellow at BT Laboratories in 1988-1989. He was an Executive Advisor to Wireless Facilities Inc., USA in 1996-2002. He is the Managing Director of Wireless Multimedia Communications LTD (his own consultancy company).

He leads an active research team working on numerous mobile and personal communications projects for third and fourth generation systems, these projects are supported both by the government and industry. He was a member of the Board of Governors of the IEEE Communications Society in 2001-2003. He is a distinguished lecturer of the IEEE Communications Society, and has been member, Chairman, and Vice-Chairman of the technical programme and organising committees of a large number of international conferences. He is also founder of the International Conference on Personal Indoor and Mobile Radio Communications (PIMRC). He is a Fellow of the Royal Academy of Engineering, Fellow of the IEE, and Fellow of the IEEE.

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APPENDIX 1

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